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## DEFENSE ACQUISITIONS

# Missile Defense Needs a Better Balance between Flexibility and Accountability

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Highlights of [GAO-07-727T](#), a testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, United States Senate

## Why GAO Did This Study

Over the next 5 years the Missile Defense Agency (MDA) expects to invest \$49 billion in the BMD system's development and fielding. MDA's strategy is to field new capabilities in 2-year blocks. In January 2006, MDA initiated its second block—Block 2006—to protect against attacks from North Korea and the Middle East.

Congress requires GAO to assess MDA's progress annually. GAO's March 2007 report addressed MDA's progress during fiscal year 2006 and followed up on program oversight issues and the current status of MDA's quality assurance program. GAO assessed the progress of each element being developed by MDA, examined acquisition laws applicable to major acquisition programs, and reviewed the impact of implemented quality initiatives.

## What GAO Recommends

GAO continues to encourage DOD to act on prior recommendations to implement a knowledge-based acquisition strategy for all BMDS elements and to adopt more transparent criteria for reporting each element's quantities, cost, and performance. In March 2007, GAO recommended that DOD adopt firm baselines, use procurement funds for operational assets, and adopt other measures to better track cost and outcomes against goals. DOD did not agree to an element-based reporting approach, but is investigating other ways to provide more program transparency.

[www.gao.gov/cgi-bin/getrpt?GAO-07-727T](http://www.gao.gov/cgi-bin/getrpt?GAO-07-727T).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Paul Francis, (202) 512-4841, francisp@gao.gov.

April 11, 2007

# DEFENSE ACQUISITIONS

## Missile Defense Needs a Better Balance between Flexibility and Accountability

### What GAO Found

During fiscal year 2006, MDA fielded additional assets for the Ballistic Missile Defense System (BMDS), enhanced the capability of some assets, and realized several noteworthy testing achievements. For example, the Ground-based Midcourse Defense (GMD) element successfully conducted its first end-to-end test of one engagement scenario, the element's first successful intercept test since 2002. However, MDA will not meet its original Block 2006 cost, fielding, or performance goals because the agency has revised those goals. In March 2006, MDA:

- reduced its goal for fielded assets to provide funds for technical problems and new and increased operations and sustainment requirements;
- increased its cost goal by about \$1 billion—from \$19.3 to \$20.3 billion; and
- reduced its performance goal commensurate with the reduction of assets.

MDA may also reduce the scope of the block further by deferring other work until a future block because four elements incurred about \$478 million in fiscal year 2006 budget overruns.

With the possible exception of GMD interceptors, MDA is generally on track to meet its revised quantity goals. But the deferral of work, both into and out of Block 2006, and inconsistent reporting of costs by some BMDS elements, makes the actual cost of Block 2006 difficult to determine. In addition, GAO cannot assess whether the block will meet its revised performance goals until MDA's models and simulations are anchored by sufficient flight tests to have confidence that predictions of performance are reliable.

Because MDA has not entered the Department of Defense (DOD) acquisition cycle, it is not yet required to apply certain laws intended to hold major defense acquisition programs accountable for their planned outcomes and cost, give decision makers a means to conduct oversight, and ensure some level of independent program review. MDA is more agile in its decision-making because it does not have to wait for outside reviews or obtain higher-level approvals of its goals or changes to those goals. Because MDA can revise its baseline, it has the ability to field fewer assets than planned, defer work to a future block, and increase planned cost. All of this makes it hard to reconcile cost and outcomes against original goals and to determine the value of the work accomplished. Also, using research and development funds to purchase operational assets allows costs to be spread over 2 or more years, which makes costs harder to track and commits future budgets.

MDA continues to identify quality assurance weaknesses, but the agency's corrective measures are beginning to produce results. Quality deficiencies are declining as MDA implements corrective actions, such as a teaming approach designed to restore the reliability of key suppliers.

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Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the Missile Defense Agency's (MDA) strategy for acquiring a Ballistic Missile Defense System (BMDS) and its progress in developing and fielding Block 2006—the second iteration of BMDS.

MDA's mission is to develop and field an integrated, layered Ballistic Missile Defense System capable of defending the United States, its deployed forces, allies, and friends against enemy ballistic missiles launched from all ranges and during all phases of the missiles' flight. To carry out its mission, MDA is fielding missile defense capabilities in 2-year increments known as blocks. The first block—Block 2004—fielded a limited initial capability that included early versions of Ground-Based Midcourse Defense (GMD); Aegis Ballistic Missile Defense (BMD); Patriot Advanced Capability-3 (PAC-3); and Command, Control, Battle Management, and Communications (C2BMC). Each of these components is an element of the integrated BMDS. During calendar years 2006 and 2007, MDA is focusing Block 2006 to enhance and field four BMDS elements—GMD, Aegis BMD, Sensors, and C2BMC. Block 2006 is not only expected to field additional assets, but it also continues the evolution of Block 2004 by providing improved GMD interceptors, enhanced Aegis BMD missiles, upgraded Aegis BMD ships, a Forward-Based X-Band Transportable radar, and enhancements to the C2BMC software.

The National Defense Authorization Acts for fiscal years 2002 and 2005 mandate that we prepare annual assessments of MDA's ongoing cost, schedule, testing, and performance progress. We issued our most recent report on March 15, 2007.<sup>1</sup> My statement today will focus on the issues covered in that report, specifically:

- MDA's progress toward developing the Block 2006 configuration of the BMDS,
- the flexibility granted to MDA and its effect on oversight and accountability, and
- the status of MDA's efforts to improve its quality processes.

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<sup>1</sup>GAO, *Defense Acquisitions: Missile Defense Acquisition Strategy Generates Results but Delivers Less at a Higher Cost*, GAO-07-387 (Washington, D.C.: Mar. 15, 2007).

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## Summary

MDA continues to make progress on missile defense, but costs have grown and less work is being completed than planned. The fielding of additional assets and the first end-to-end test of GMD were notable accomplishments in fiscal year 2006, as was being able to put BMDS on alert status. Yet, MDA will not meet its original Block 2006 cost, fielding, or performance goals. MDA will field fewer assets than planned, which will cause a commensurate decrease in performance. Although scope has been reduced, costs are expected to increase by about \$1 billion. There is no baseline against which to measure cost. For several reasons, we cannot be precise about the actual cost of Block 2006. MDA defers work from block to block and counts the cost of deferred work as a cost of the block in which the work is performed even though that work benefits the original block. For example, work deferred from Block 2004 is counted as a cost of Block 2006. Element program offices report costs inconsistently, with most underreporting costs. The cost of Block 2006 may change further because MDA may defer other work from Block 2006 until Block 2008 to cover \$478 million in fiscal year 2006 budget overruns experienced by element prime contractors. We could not assess whether MDA is likely to achieve its revised performance goal because too few tests have been completed to have confidence in the models and simulations used to predict performance. Overall, the block approach has had advantages for fielding capabilities incrementally, but it has not proven to be a good construct for reconciling actual cost and performance with the justifications that MDA submits to support its budget request.

Because the BMDS program has not formally entered system development and demonstration, application of laws that are designed to facilitate oversight and accountability of DOD acquisition programs has effectively been deferred. This gives MDA unique latitude to manage the BMDS. Specifically, the BMDS cost, schedule, and performance baseline does not have to be approved by anyone outside MDA. MDA is not yet required to obtain independent assessments of each configuration's cost or test results. Unlike other programs, MDA is permitted to use research and development funds to incrementally fund all activities, including the purchase and support of operational assets. MDA keeps others informed, but it does not need their approval. Collectively, this flexibility enables MDA to be more agile in its decision-making. By the same token, MDA can revise its own baseline to field fewer assets than planned, defer work to a future block, and increase planned cost. Over time, it becomes difficult to reconcile cost and outcomes against original goals and to determine the value of the work accomplished. Ultimately, Congress may know that it is getting less than expected for its investment, but it will not necessarily know the cost of what it did receive or whether it is being asked to again

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appropriate funds for work that had been scheduled in a prior block but could not be completed because its funding was diverted to pay for other activities. The foregoing does not mean that MDA has acted inconsistently with the authorities it has been granted. Rather, MDA has the sanctioned flexibility to manage exactly as it has. It could be argued that without this flexibility, the initial capability fielded last year and put on alert would not have been possible. Yet, the question remains as to whether this degree of flexibility should be retained for a program that is planning to spend on the order of \$10 billion a year for the foreseeable future.

MDA auditors report that quality deficiencies are declining and on-time deliveries are improving as corrective measures are implemented. For example, MDA quality audits show that one key supplier has decreased open quality issues by 64 percent, reduced test failures by 43 percent, and increased on-time deliveries by 9 percent. The mechanisms being used to improve quality assurance processes include the development of a teaming approach to restore reliability in key suppliers, conducting regular quality audits, adjusting award fee plans to encourage contractors to maintain a good quality assurance program and implement industry best practices, and continuing to incorporate key quality provisions into the agency's prime contracts.

In our March 2007 report, we recommended that MDA establish firm baselines for those elements considered far enough along to be in system development and demonstration, and report against those baselines; propose an approach for those same elements that provides information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation; include in blocks only those elements that will field capabilities during the block period and develop a firm block baseline that includes the unit cost of its assets; request and use procurement funds, rather than research, development, test, and evaluation funds, to acquire fielded assets; and conduct an independent evaluation of the ABL and KEI elements prior to making a decision on the future of the programs.

DOD partially concurred with the report's first three recommendations, but did not agree to use procurement funds to acquire fielded assets or to conduct an independent evaluation of the ABL and KEI elements. In partially agreeing, DOD recognized the need to provide greater program transparency and committed to providing information consistent with acquisition laws that govern baselines and unit cost reporting. However, DOD objected to the element-centric approach recommended, believing that this would detract from managing the BMDS as a single, integrated

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system. DOD also stated that reporting at the BMDS-level in accordance with our third recommendation would appear to be inconsistent with reporting at the element level. We continue to believe that all recommended changes are needed to provide a better balance between MDA's flexibility and BMDS program transparency. Because DOD awards contracts and requests funding by individual elements that compose the BMDS, we believe that the element approach is the best way to achieve increased program transparency. However, a BMDS-level baseline derived from the capabilities that individual elements yield is needed to describe and manage a BMDS-wide capability. We also believe that the use of procurement funds contributes to program transparency by making clear at the outset the size of the investment being requested in fielded assets. Finally, we continue to believe that an independent assessment of the ABL and KEI capabilities can provide a transparent basis for making decisions on the future of the programs, but we did revise the recommendation to specify that the assessment should follow key demonstrations in 2009.

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## Background

Missile defense is important because at least 25 countries now possess or are acquiring sophisticated missile technology that could be used to attack the United States, deployed troops, friends, and allies. MDA's mission is to develop and field an integrated, layered BMDS capable of defending against enemy ballistic missiles launched from all ranges and during all phases of the missiles' flight. DOD has spent and continues to spend large sums of money to defend against this threat. Since the mid-1980s, about \$107 billion has been spent, and over the next 5 years, another \$49 billion is expected to be invested. While the initial set of BMDS assets was fielded during 2004-2005, much of the technical and engineering foundation was laid by this prior investment. DOD also expects to continue investing in missile defense for many more years as the system evolves into one that can engage an enemy ballistic missile launched from any range during any phase of the missile's flight.

To enable MDA to field and enhance a missile defense system quickly, the Secretary of Defense, in 2002, directed a new acquisition strategy. The Secretary's strategy included removing the BMDS program from DOD's traditional acquisition process until a mature capability was ready to be handed over to a military service for production and operation. Therefore, development of the BMDS program is not segmented into concept refinement, technology development, and system development and demonstration phases, as other major defense acquisition programs are. Instead, MDA initiates one development phase that incorporates all acquisition activities and that is known simply as research and

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development. MDA also has approval to use research and development funds, rather than procurement funds, to acquire assets that could be made available for operational use.

To carry out its mission, MDA is fielding missile defense capabilities in 2-year increments known as blocks. The first block—Block 2004—fielded a limited initial capability that included early versions of GMD, Aegis BMD, PAC-3, and C2BMC. This was the capability that was put on alert status in 2006. MDA formally began a second BMDS block on January 1, 2006, that will continue through December 31, 2007. This block is expected to provide protection against attacks from North Korea and the Middle East. During the 2-year block timeframe, MDA is focusing its program of work on the enhancement and fielding of additional quantities of the GMD, Aegis BMD, and C2BMC elements, as well as fielding a Forward-Based X-Band radar that is part of the Sensors element. When MDA defined the block in March 2005, shortly after submitting its fiscal year 2006 budget request to Congress, it also included three other elements—Airborne Laser (ABL), Space Tracking and Surveillance System (STSS), and Terminal High Altitude Area Defense (THAAD)—that are primarily developmental in nature. According to MDA, these elements were included in the block even though they were not expected to be operational until future blocks because the elements offered some emergency capability during the block timeframe. In March 2006, MDA removed THAAD from Block 2006. According to MDA, this action better aligned resources and fielding plans. The development of two other elements—Multiple Kill Vehicle (MKV) and Kinetic Energy Interceptor (KEI)—also continued in fiscal year 2006, but these elements were not considered part of Block 2006 because, according to MDA officials, the elements provide no capability—emergency or operational—during the block.

The bulk of the funding that MDA requests for the BMDS each fiscal year is for the development, fielding, and sustainment of BMDS elements. For example, in fiscal year 2006, funding for the nine BMDS elements collectively accounted for 72 percent of MDA's research and development budget. MDA requests funds for each of these elements, with the exception of C2BMC and THAAD, under separate budget line items. In addition, MDA issues separate contracts for each of the nine elements.

Prior to beginning each new block, MDA establishes and submits block goals to Congress. These goals present the business case for the new block. MDA presented its Block 2006 goals to Congress in March 2005, shortly after submitting its fiscal year 2006 budget. At that time, MDA told Congress that the agency expected to field the following assets: up to

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15 GMD interceptors, an interim upgrade of the Thule Early Warning Radar, a Forward-Based X-Band radar, 19 Aegis BMD missiles, 1 new Aegis cruiser for the missile defense mission, 4 new Aegis destroyers capable of providing long-range surveillance and tracking, and 8 Aegis destroyers upgraded for the engagement mission. MDA's cost goal for the development of the six elements that compose the block, the manufacture of assets being fielded, and logistical support for fielded assets was \$19.3 billion.<sup>2</sup> MDA also notified Congress of the Block 2006 performance goals established for the BMDS. These goals were composed of numerical values for the probability of engagement success, the land area from which the BMDS could deny a launch, and the land area that the BMDS could defend.<sup>3</sup> Fiscal year testing goals were also established by element program offices, but these goals were not formally reported to Congress.

We examined numerous documents and held discussions with agency officials. In determining the elements' progress toward Block 2006 goals, we looked at the accomplishments of six BMDS elements—ABL, Aegis BMD, BMDS Sensors, C2BMC, GMD, and STSS—that compose the Block 2006 configuration. Our work included examining System Element Reviews, test plans and reports, production plans, and Contract Performance Reports. We also interviewed officials within each element program office and within MDA functional offices. In assessing whether MDA's flexibility impacts BMDS oversight and accountability, we examined documents such as those defining MDA's changes to Block 2006 goals, acquisition laws for major DOD programs, and BMDS policy directives issued by the Secretary of Defense. We examined the current status of MDA's quality assurance program by visiting various contractor facilities and holding discussions with MDA officials, such as officials in the Office of Quality, Safety, and Mission Assurance. We performed our work from June 2006 through March 2007 in accordance with generally accepted government auditing standards.

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<sup>2</sup>We have adjusted the cost goal reported to Congress to reflect MDA's removal of the THAAD element and its future development cost from Block 2006.

<sup>3</sup>Specifics of the BMDS performance goals are classified and cannot be presented in an open forum.

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## **MDA Has Made Progress with Block 2006, but Scope Has Been Reduced and Costs Have Gone Up**

MDA made progress during fiscal year 2006, but it will not achieve the goals it set for itself in March 2005. One year after establishing its Block 2006 goals, the agency informed Congress that it planned to field fewer assets, reduce performance goals, and increase the block's cost goal. It is also likely that in addition to fielding fewer assets, other Block 2006 work will be deferred to offset growing contractor costs. MDA is generally on track to meet its revised quantity goals, but the performance of the BMDS cannot yet be fully assessed because there have been too few flight tests conducted to anchor the models and simulations that predict overall system performance. Several elements continue to experience technical problems that pose questions about the performance of the fielded system and could delay the enhancement of future blocks. In addition, the Block 2006 cost goal cannot be reconciled with actual costs because work travels to and from other blocks and individual element program offices report costs inconsistently.

During the first year of Block 2006, MDA continued to improve the BMDS by enhancing its performance and fielding additional assets. In addition, the BMDS elements achieved some notable test results. For example, the GMD element completed its first successful intercept attempt since 2002. The test was also notable because it was an end-to-end test of one engagement scenario, the first such test that the program has conducted. Also, the Aegis BMD element conducted a successful intercept test of its more capable Standard Missile-3 design that is being fielded for the first time during Block 2006.

In March 2006, soon after the formal initiation of Block 2006, MDA announced that events such as hardware delays, technical challenges, and budget cuts were causing the agency to field fewer assets than originally expected. MDA's goal now calls for fielding 3 fewer GMD interceptors; deferring the upgrade of the Thule radar until Block 2008, when it can be fully upgraded; producing 4 fewer Aegis BMD missiles; upgrading 1 less Aegis destroyer for the engagement mission; and delivering 3 C2BMC Web browsers rather than the more expensive C2BMC suites. With the exception of the GMD interceptors, MDA is on track to deliver the revised quantities. The GMD program planned to emplace 8 interceptors during calendar year 2006, but was only able to emplace 4. Program officials told us that the contractor has increased the number of shifts that it is working and that this change will accelerate deliveries. However, to meet its quantity goal, the GMD program will have to more than double its interceptor emplacement rate in 2007.

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MDA also reduced the performance expected of Block 2006 commensurate with the reduction in assets. However, insufficient data are available to determine whether MDA is on track to meet the new goal. Although the GMD test program has achieved some notable results, officials in DOD's Office of the Director of Operational Test and Evaluation told us that the element has not completed sufficient tests to provide a high level of confidence that the BMDS can reliably intercept intercontinental ballistic missiles. Further testing is needed as well to confirm that GMD can use long-range tracking data developed by Aegis BMD to prepare—in real time—a weapon system task plan for GMD interceptors.

Delayed testing and technical problems may also impact the performance of the current and future configurations of the BMDS. For example, the performance of the Block 2006 configuration of the Aegis BMD missile is unproven because design changes in the missile's solid attitude and divert system and one burn pattern of the third stage rocket motor were not flight-tested before they were cut into the production line. The current configuration of the GMD interceptor also continues to struggle with an anomaly that has occurred in each of the element's flight tests. The anomaly has not yet prevented the program from achieving its primary test objectives, but neither its source nor a solution has been clearly identified or defined. The reliability of some GMD interceptors remains uncertain as well because inadequate mission assurance/quality control procedures may have allowed less reliable or inappropriate parts to be incorporated into the manufacturing process. Program officials plan to introduce new parts into the manufacturing process, but not until interceptor 18. MDA also plans to retrofit the previous 17 interceptors, but not until fiscal year 2009. In addition to the performance problems with elements being fielded, the ABL element that is being developed to enhance a future BMDS configuration experienced technical problems with its Beam Control/Fire Control component. These problems have delayed a lethality demonstration that is needed to demonstrate the element's leading-edge technologies. ABL is an important element because if it works as desired, it will defeat enemy missiles soon after launch, before decoys are released to confuse other BMDS elements. MDA plans to decide in 2009 whether ABL or KEI, whose primary boost phase role is to mitigate the risk in the ABL program, will become the BMDS boost phase capability.

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While MDA reduced Block 2006 quantity and performance goals, it increased the block's cost goal from about \$19.3 billion to approximately \$20.3 billion.<sup>4</sup> The cost increases were caused by the addition of previously unknown operations and sustainment requirements, realignment of the GMD program to support a successful return to flight, realignment of the Aegis BMD program to address technical challenges and invest in upgrades, and preparations for round-the-clock operation of the BMDS. Although MDA is expected to operate within its revised budget of \$20.3 billion, the actual cost of the block cannot be reconciled with the cost goal. To stay within its Block 2004 budget, MDA shifted some of that block's work to Block 2006 and is counting it as a cost of Block 2006, which overstates Block 2006 cost. In addition, MDA officials told us that it is likely that some Block 2006 work will be deferred until Block 2008 to cover the \$478 million fiscal year 2006 budget overruns experienced by five of the six element prime contractors. If MDA reports the cost of deferred work as it has in the past, the actual cost of Block 2006 will be complicated further. Another factor complicating the reconciliation of Block 2006 cost is that the elements report block cost inconsistently. Some elements appropriately include costs that the program will incur to reach full capability, while others do not.<sup>5</sup>

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## MDA's Flexibility Makes Oversight and Accountability More Difficult

Because the BMDS has not formally entered the system development and demonstration phase of the acquisition cycle, it is not yet required to apply several important oversight mechanisms contained in certain acquisition laws that, among other things, provide transparency into program progress and decisions. This has enabled MDA to be agile in decision making and has facilitated fielding an initial BMDS capability quickly. On the other hand, MDA operates with considerable autonomy to change goals and plans, making it difficult to reconcile outcomes with original expectations and to determine the actual cost of each block and of individual operational assets.

Over the years, a framework of laws has been created that make major defense acquisition programs accountable for their planned outcomes and cost, give decision makers a means to conduct oversight, and ensure some

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<sup>4</sup>Specific details regarding the cost increase can be found in GAO-07-387.

<sup>5</sup>An element has reached full capability if it has completed all system-level testing and has shown that it meets expectations. At this state, all doctrine, organization, training, material, leadership, personnel, and facilities are in place.

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level of independent program review. The application of many of these laws is triggered by a program's entry into system development and demonstration. To provide accountability, once major defense programs cross this threshold, they are required by statute to document program goals in an acquisition program baseline that as implemented by DOD has been approved by a higher-level DOD official prior to the program's initiation. The baseline provides decision makers with the program's best estimate of the program's total cost for an increment of work, average unit costs for assets to be delivered, the date that an operational capability will be fielded, and the weapon's intended performance parameters. Once approved, major acquisition programs are required to measure their program against the baseline, which is the program's initial business case, or obtain the approval of a higher-level acquisition executive before making significant changes. Programs are also required to regularly provide detailed program status information to Congress, including information on cost, in Selected Acquisition Reports. In addition, Congress has established a cost-monitoring mechanism that requires programs to report significant increases in unit cost measured from the program baseline.<sup>6</sup>

Other statutes provide for independent program verifications and place limits on the use of appropriations. For example, 10 U.S.C. 2434 prohibits the Secretary of Defense from approving system development and demonstration unless an independent estimate of the program's life-cycle cost has been conducted by the Secretary. In addition, 10 U.S.C. 2399 requires completion of initial operational test and evaluation before a program can begin full-rate production. These statutes ensure that someone external to the program examines the likelihood that the program can be executed as planned and will yield a system that is effective and suitable for combat. The use of an appropriation is also controlled so that it will not be used for a purpose other than the one for which it was made, except as otherwise provided by law. Research and development appropriations are typically specified by Congress to be used to pay the expenses of basic and applied scientific research, development, test, and evaluation. On the other hand, procurement appropriations are, in general, to be used for production and manufacturing. In the 1950s, Congress established a policy that items being purchased with procurement funds be fully funded in the year that the item is procured. This is meant to prevent a program from incrementally funding the

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<sup>6</sup>10 U.S.C. 2433, known as Nunn-McCurdy.

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purchase of operational systems. Full funding ensures that the total procurement costs of weapons and equipment are known to Congress up front and that one Congress does not put the burden on future Congresses of deciding whether they should appropriate additional funds or expose weapons under construction to uneconomic start-up and stop costs.

The flexibility to defer application of specific acquisition laws has benefits. MDA can make decisions faster than other major acquisition programs because it does not have to wait for higher-level approvals or independent reviews. MDA's ability to quickly field a missile defense capability is also improved because assets can be fielded before all testing is complete. MDA considers the assets it has fielded to be developmental assets and not the result of the production phase of the acquisition cycle. Additionally, MDA enjoys greater flexibility than other programs in the use of its funds. Because MDA uses research and development funds to manufacture assets, it is not required to fully fund those assets in the year of their purchase. Therefore, as long as its annual budget remains fairly level, MDA can request funds to address other needs.

On the other hand, the flexibilities granted MDA make it more difficult to conduct program oversight or to hold MDA accountable for the large investment being made in the BMDS program. Block goals can be changed by MDA, softening the baseline used to assess progress toward expected outcomes. Similarly, because MDA can redefine the work to be completed during a block, the actual cost of a block cannot be compared with the original cost estimate. MDA considers the cost of deferred work, which may be the delayed delivery of assets or other work activities, as a cost of the block in which the work is performed even though the work benefits or was planned for a prior block. Further, MDA does not track the cost of the deferred work and, therefore, cannot make adjustments that would match the cost with the block that is benefited. For example, during Block 2004, MDA deferred some planned development, deployment, characterization, and verification activities until Block 2006 so that it could cover contractor budget overruns. The costs of the activities are now considered part of the cost of Block 2006. Also, although Congress provided funding for these activities during Block 2004, MDA used these funds for the overruns and will need additional funds during Block 2006 to cover their cost. Planned and actual unit costs of fielded assets are equally difficult to reconcile. Because MDA is not required to develop an approved acquisition program baseline, it is not required to report the expected

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average unit cost of assets. Also, because MDA is not required to report significant increases in unit cost,<sup>7</sup> it is not easy to determine whether an asset's actual cost has increased significantly from its expected cost.

Finally, using research and development funds to purchase fielded assets further reduces cost transparency because these dollars are not covered by the full-funding policy as are procurement funds. Therefore, when a program for a 2-year block is first presented in the budget, Congress is not necessarily fully aware of the dimensions and cost of that block. For example, although a block may call for the delivery of a specific number of interceptors, the full cost of those interceptors is requested over 3 to 5 years. Calculating unit costs from budget documents is difficult because the cost of components that will become fielded assets may be spread across 3 to 5 budget years—a consequence of incremental funding.

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## MDA Audits Show Improvement in Quality Processes

During Block 2004, poor quality control procedures caused the missile defense program to experience test failures and slowed production. MDA has initiated a number of actions to correct quality control weaknesses, and the agency reports that these actions have been largely successful. Although MDA continues to identify quality assurance procedures that need strengthening, recent audits by MDA's Office of Quality, Safety, and Mission Assurance show such improvements as increased on-time deliveries, reduced test failures, and sustained improvement in product quality.

MDA has taken a number of steps to improve quality assurance. These include developing a teaming approach to restore the reliability of key suppliers, conducting regular quality inspections to quickly identify and find resolutions for quality problems, adjusting award fee plans to encourage contractors to maintain a good quality assurance program and encourage industry best practices, as well as placing MDA-developed assurance provisions on prime contracts. For example, as early as 2003, MDA made a critical assessment of a key supplier's organization and determined that the supplier's manufacturing processes lacked discipline,

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<sup>7</sup>Because the BMDS or its major elements have not been designated by MDA as being in system development and demonstration, no acquisition program baseline is required under 10 U.S.C. § 2435. Thus there is no basis for determining unit cost under 10 U.S.C. § 2433 (also known as Nunn-McCurdy), which requires calculation of unit cost from the baseline. Further, for the same reason, only limited Selected Acquisition Reports to Congress on program status are generated (10 U.S.C. 2432(h)) that do not include unit costs.

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its corrective action procedures were ineffective, its technical data package was inadequate, and personnel were not properly trained. The supplier responded by hiring a Quality Assurance Director, five quality assurance professionals, a training manager, and a scheduler. In addition, the supplier installed an electronic problem-reporting database, formed new boards—such as a failure review board—established a new configuration management system, and ensured that manufacturing activity was consistent with contract requirements. During different time periods between March 2004 and August 2006, MDA measured the results of the supplier's efforts and found a 64 percent decrease in open quality control issues, a 43 percent decline in test failures, and a 9 percent increase in on-time deliveries. MDA expanded its teaming approach in 2006 to another problem supplier and reports that many systemic solutions are already underway.

During fiscal year 2006, MDA's audits continued to identify both quality control weaknesses and quality control procedures that contractors are addressing. During 2006, the agency audited six contractors and identified 372 deficiencies and observations.<sup>8</sup> As of December 2006, the six contractors had collectively closed 157, or 42 percent, of the 372 audit findings. MDA also reported other signs of positive results. For example, in 2006, MDA conducted a follow-on audit of Raytheon, the subcontractor for GMD's exoatmospheric kill vehicle. A 2005 audit of Raytheon had found that the subcontractor was not correctly communicating essential kill vehicle requirements to suppliers, did not exercise good configuration control, and could not build a consistent and reliable product. The 2006 audit was more positive, reporting less variability in Raytheon's production processes, increasing stability in its statistical process control data, fewer test problem reports and product waivers, and sustained improvement in product quality.

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## Actions Recommended In Our Recent Report

In our March 15, 2007, report, we made several recommendations to DOD to increase transparency in the missile defense program. These included:

- Develop a firm cost, schedule, and performance baseline for those elements considered far enough along to be in system development and demonstration, and report against that baseline.

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<sup>8</sup>Deficiencies are considered more serious and are recognized when contractors do not comply with a contractual or internal procedure requirement. On the other hand, observations are made when a contractor fails to employ an MDA or industry best practice.

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- Propose an approach for those same elements that provides information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation for major DOD programs. Such an approach could provide necessary information while preserving the MDA Director's flexibility to make decisions.
- Include in blocks only those elements that will field capabilities during the block period and develop a firm cost, schedule, and performance baseline for that block capability, including the unit cost of its assets.
- Request and use procurement funds, rather than research, development, test, and evaluation funds, to acquire fielded assets.

DOD partially agreed with the first three recommendations and recognized the need for greater program transparency. It committed to provide information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation. DOD did not agree to use elements as a basis for this reporting, expressing its concern that an element-centric approach to reporting would have a fragmenting effect on the development of an integrated system. We respect the need for the MDA Director to make decisions across element lines to preserve the integrity of the system of systems. We recognize that there are other bases rather than elements for reporting purposes. However, we believe it is essential that MDA report in the same way that it requests funds. Currently MDA requests funds and contracts by element, and at this time, that appears to be the most logical way to report. MDA currently intends to modify its current block approach. We believe that a management construct like a block is needed to provide the vehicle for making system-of-system decisions and to provide for system-wide testing. However, at this point, the individual assets to be managed in a block—including quantities, cost, and delivery schedules—can only be derived from the individual elements.

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Mr. Chairman, this concludes my statement. I would be pleased to respond to any questions you or members of the subcommittee may have.

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